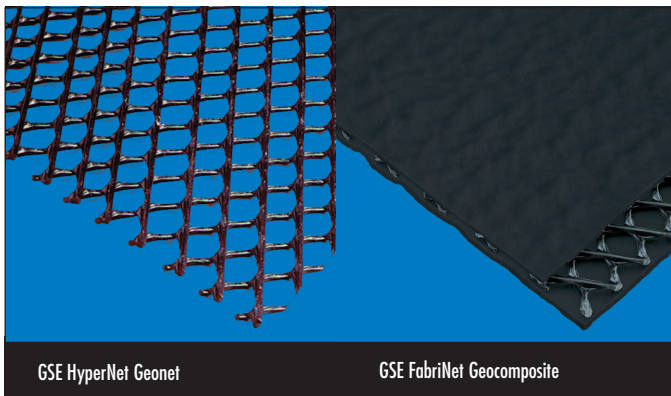


## GSE Drainage Products

### ASSURED QUALITY FOR A LIFETIME

GSE drainage products have been manufactured for over 20 years. Millions of square feet of drainage products are produced every year for landfill applications.

GSE starts with the highest quality resin blended with prime grade carbon black, UV stabilizers and antioxidants to ensure the product will have a long life. The material must pass stringent testing requirements and inspection prior to shipment.



### SUPERIOR PRODUCT COMPOSITION

GSE HyperNet geonet is manufactured to form a three-dimensional bi-planar drainage structure that is used to replace a sand or gravel subsurface drainage system. GSE FabriNet will be needed if the drainage structure will be in contact with a soil type. This is accomplished by heat laminating a needle punched nonwoven geotextile to either one or both side to prevent soil particles from clogging the drainage core. Geotextiles are also laminated to geonet cores when there is a need to increase frictional characteristics with another geosynthetic type. GSE HyperNet is available in thicknesses of 200 mil or 300 mil. GSE FabriNet is available in thicknesses of 200 mil to 300 mil and can be laminated with geotextiles from 6 oz/yd<sup>2</sup> to 16 oz/yd<sup>2</sup>.

### LEACHATE COLLECTION AND REMOVAL SYSTEM

The leachate collection and removal system (LCRS) is a lateral drainage system that is used to remove leachate from the lining system to maintain less than or equal to 1 foot head of liquid as required by Subtitle D. Drainage geocomposites are used in this application in place of natural soils because natural soils require extra preparation of the sub-grade and consume valuable airspace (typically 1

foot of soil). Geosynthetic drainage products are installed by simply rolling the product down the slope. Drainage geosynthetics require less sub-grade preparation and occupy far less airspace than natural drainage soils (0.200 inches to 0.275 inches). Drainage geocomposites provide excellent long-term hydraulic performance and creep resistance to ensure the leachate collection system will continue working over the life of the project.

### LEAK DETECTION SYSTEM (LDS)

Subtitle C hazardous waste landfills regulations require a double liner system consisting of two HDPE geomembrane liners with a geonet in the middle to comprise a leak detection system. This system is used to warn of any failures in the primary liner system. The use of a bi-planar drainage geonet provides high transmissivity which will continue to limit the head on the secondary liner to 1 foot as required by regulations. Bi-planar geonets will also move leachate quickly through the system to leak detection locations.



The landfill gas collection system is used to collect gases such as methane (CH<sub>4</sub>) and carbon dioxide (CO<sub>2</sub>) that can build up underneath the geomembrane. Gases can be collected and used for energy production or distributed to a venting or capturing system to avoid air pollution. Landfill gas collection systems are used to prevent gas from accumulating underneath the liner system which could cause the liner to rupture. Instead of using a layer of sand for gas collection, a bi-planar geonet or geocomposite can be utilized to accomplish the same task. The thickness of the geonet depends on the amount of gas generation expected during waste decomposition.

## SUB-GRADE GAS REMOVAL

Gas pressure, due to the biodegradation of organic materials, can cause the subgrade to release gasses that will build up underneath a geomembrane and potentially cause a failure in the geomembrane liner system. In a final cover system, gas pressure, due to the release of gasses from the waste, can accumulate underneath the geomembrane causing slope instability or slope failure. In order to effectively reduce gas build-up, bi-planar geocomposite strips, commonly called strip drains, can be installed to discharge gas to a gas venting system or gas collection system. Spacing between strip drains and the thickness of the geocomposite used is based on the amount of gas production released from the landfill surface and the maximum anticipated field load expected during the life of the project.

## EASE OF INSTALLATION AND PRODUCT SUCCESS

GSE drainage products have been used in the above applications for many years with great success. Drainage geosynthetics require less excavation, allow for more air-space and are easy to handle. GSE drainage products are provided in roll form and can be installed with a limited amount of crew personnel and equipment.



## ADDITIONAL INFORMATION

If you have an upcoming project, please contact us. We will provide you with recommendations, an estimate for material installation, and contacts for a GSE approved installer.

AP028 Drainage R03/01/06

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